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STYLE OF DEFORMATION AND UPLIFT RATE OF THE HOLLYWOOD FAULT, SOUTHERN CALIFORNIA

The activity and style of deformation along the Hollywood fault differs significantly between range front sites in Hollywood and West Hollywood. Transects of borings have revealed a variety of fault orientations, sense of slip, and fault zone complexities that, collectively, suggest a significant component of left-lateral slip. The vertical component of deformation across the Hollywood fault zone is now better constrained by the discovery of a Pleistocene marine abrasion platform and shoreline angle in West Hollywood. The abrasion platform cuts a prominent sea cliff escarpment along the base of the Hollywood Hills, which has been heretofore interpreted as an escarpment marking the location of the main Hollywood fault. We have traced the abrasion platform southward from Sunset Boulevard and show that the main, north-dipping Hollywood fault is, locally, at least 250 m south of Sunset Boulevard and it's previously mapped location. Similarly, we have traced the paleo-shoreline of the platform over a lateral distance of nearly a kilometer along Sunset Boulevard at about an elevation of 100 m.

Overlying the lower marine abrasion platform is a sequence of alluvial deposits that are separated by well-developed soils. Comparison of the soils with dated soils in the southern California region suggests that the underlying abrasion platform is on the order of 400-900 ka in age. This age compares favorably with the age of marine sediments identified in the La Brea Plain, south of our study area. Using this age range, we calculate a long-term middle to late Quaternary uplift rate for the Hollywood Hills to be 0.11-0.25 mm/yr. Using the elevations and ages of the marine sediments (320 ka Stage 9) in the La Brea Plain determined by Quinn et al. (2000), we calculate an uplift rate of the footwall of the Hollywood fault on the La Brea Plain to be about 0.14 mm/yr. Thus, the differential uplift rate across the Hollywood fault and Hollywood Basin is on the order of 0-0.11 mm/yr. These results indicate that the component of shortening that can be attributed to the generally high-angle Hollywood fault is small and that other structures in the northern Los Angeles basin region must account for the 5-8 mm/yr of contraction between the Palos Verdes peninsula and Pasadena (JPL) observed in GPS measurements.